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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,777	12/03/2003	Daniel Bichon	1201-97	3816

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EXAMINER	
SCHLIENTZ, LEAH H	

ART UNIT	PAPER NUMBER
1618	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/725,777	BICHON ET AL.	
	Examiner	Art Unit	
	Leah Schlientz	1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *17-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 07/695,343.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group 1 (claims 1 – 16 and 31) in the reply filed on 4/27/2007 is acknowledged. Claims 1 – 31 are pending, of which claims 17 – 30 are withdrawn from consideration as being drawn to a non-elected invention. Claims 1 – 16 and 31 are readable upon the elected invention are examined herein on the merits for patentability.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 – 16 and 31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 – 22 of U.S. Patent No. 6,200,548. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to microcapsules or microballoons comprising a deformable and resilient interfacially deposited polymer membrane which is filled with a gas. The microbubbles are overlapping in size and have the same claimed membrane thickness and porosity. The microbubbles are dispersible in an aqueous carrier. The polymers of the membrane are materially the same (i.e. polyglutamic and aspartic acid esters, etc.). Accordingly, both sets of claims are overlapping in scope and are obvious variants of one another.

Claims 1 – 16 and 31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 – 13 of U.S. Patent No. 5,840,275. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to microcapsules or microballoons comprising a polymer membrane which is filled with a gas. The microbubbles are overlapping in size and have the same claimed membrane thickness and porosity. The microbubbles are dispersible in an aqueous carrier. The polymers of the membrane are materially the same (i.e. polyglutamic and aspartic acid esters, etc.). Accordingly, both sets of claims are overlapping in scope and are obvious variants of one another.

Claims 1 – 16 and 31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 – 16 of U.S. Patent No. 5,863,520. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to microcapsules or microballoons comprising a polymer membrane which is filled with a gas which are intended for use in ultrasonic echogenic imaging. The microbubbles are overlapping in size and have the same claimed membrane thickness and porosity. The microbubbles are dispersible in an aqueous carrier. The polymers of the membrane are materially the same (i.e. polyglutamic and aspartic acid esters, etc.). Accordingly, both sets of claims are overlapping in scope and are obvious variants of one another.

Claims 1 – 16 and 31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 – 15 of U.S. Patent No. 6,123,922. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to microcapsules or microballoons comprising a polymer a resilient and interfacially depositable membrane which is filled with a gas. The microbubbles are overlapping in size and have the same claimed membrane thickness and porosity. The microbubbles are dispersible in an aqueous carrier. The polymers of the membrane are materially the same (i.e. polyglutamic and aspartic acid esters, etc.). Accordingly, both sets of claims are overlapping in scope and are obvious variants of one another.

Claims 1 – 7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 9 and 10 of U.S. Patent No. 5,578,292. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to microcapsules or microballoons comprising a polymer membrane which is filled with a gas. The microbubbles are dispersible in an aqueous carrier. The polymers of the membrane are materially the same (i.e. polyglutamic and aspartic acid esters, etc.) and accordingly would have the same functional characteristics (i.e. deformable, etc.). Accordingly, both sets of claims are overlapping in scope and are obvious variants of one another.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is drawn to microballons with a polymer membrane having a porosity ranging from a few nanometers to several hundreds or thousands of nanometers, preferably 50 – 2000 nm. The term few in the claim is a relative term which renders the claim indefinite. The term few is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree. As such, the metes and bounds of the claim is not clearly set forth and the scope of the invention cannot be distinctly ascertained.

Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim contains the trademark/trade name "Resomer." Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a DL-lactide polymer and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 324938.

EP 324938 discloses all features of claims 1 and 2 as recited, namely, microspheres used as ultrasonic imaging agent where the microspheres are gas filled and bounded by a polymer. Regarding the instant claim limitations wherein the polymer is "deformable" and "resilient," such relative terms do not have clear art-recognized values wherein if a microbubble has a particular value for resilience or deformation, for instance, the microbubble would clearly, or not be, resilient or deformable. Regarding the instant claim limitation wherein the polymer is interfacially deposited, such a limitation appears to be a product-by-process type limitation. Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1 – 16 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 324938, Feinstein (US 4,774,958) and Ticker (US 4,276,885), in view of Kent (US 4,675,189).

The instant claims are drawn to synthetic microcapsules or microballoons having a polymer membrane wherein the size, porosity and wall thickness of the microballoons are within defined ranges.

EP 324938, Feinstein and Tickner all disclose microcapsules for ultrasonic imaging that are surrounded by a polymeric membrane and are gas filled.

Kent discloses the use of polylactic acid polymers in such preparations (column 1, lines 30 – 46).

The use of contrast enhancing agents such as air-filled microballoons or microcapsules comprising a porous or non-porous polymer membrane is well known in the art of ultrasonic imaging (see e.g. cited art). Polymers such as polypeptides, proteins, saccharides, etc. have been widely employed in the art for such purposes. The sizes of the instantly claimed microballoons overlaps with that of the cited art (i.e. see Tickner, abstract). The concentration range of the dispersion of microballoons also

overlaps with the cited art (see EP 324938, claim 9). While the cited references do not specifically recite the porosity of the polymer membrane, it is noted that the size of the microballoons are overlapping, and that the polymers used are the same or similar, thus the microballoons of the prior art would be capable of the having the same or similar porosity as that claimed, whether or not such properties were explicitly stated. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to prepare microballoons by the substitution of polylactic acid, as taught by Kent, for the various membrane polymers taught in the microballoons of EP 324938, Feinstein or Tickner and modification of such properties as size, porosity, and wall thickness so as to optimize the microspheres for in vivo use. Regarding the functional description of the microbubbles as "resilient" or "deformable," such relative terms do not have clear art-recognized values wherein if a microbubble has a particular value for resilience or deformation, for instance, the microbubble would clearly, or not be, resilient or deformable.

Claims 1 – 16 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feinstein (US 4,774,958), Temple (US 4,089,800) and Reinhardt (US 5,425,366).

The instant claims are drawn to synthetic microcapsules or microballoons having a polymer membrane wherein the size, porosity and wall thickness of the microballoons are within defined ranges.

Feinstein discloses protein microbubbles which have been synthetically altered either by heat denaturation or chemical modification (column 5, lines 9 – 32). The

microbubbles are taught to be within 2 – 6 micron, which is within the claimed size range. Temple (column 2, lines 5 – 25) and Reinhardt (column 6, lines 6 – 20; column 8, lines 60 – 64) teach synthetic microbubbles which are formed via a similar process to that of the instant application. Temple teaches the diameter of the microbubbles should be from 0.1 – 250 micron and Reinhardt teaches microbubbles which are 10 – 100 micron in diameter. Temple teaches a wall thickness within the claimed range, but fails to specifically recite a porosity. Both Reinhardt and Feinstein do not specify wall thickness or porosity of their microbubbles.

While Feinstein, Temple, and Reinhardt do not specifically teach the exact claim limitations, it would have been obvious to one of ordinary skill in the art that the size, porosity, and wall thickness of microspheres may be modified so as to optimize the microspheres for in vivo use. Regarding the functional description of the microbubbles as "resilient" or "deformable," such relative terms do not have clear art-recognized values wherein if a microbubble has a particular value for resilience or deformation, for instance, the microbubble would clearly, or not be, resilient or deformable.

Claims 1 – 16 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino *et al.* (*Chem. Pharm. Bull.*, 1985, 33, p. 1195 – 1201); Ganguly *et al.* (*J. Microencapsulation*, 1989, 6, p. 193 – 198) and Tickner (US 4,276,885).

The instant claims are drawn to synthetic microcapsules or microballoons having a polymer membrane wherein the size, porosity and wall thickness of the microballoons are within defined ranges.

Makino discloses polylactide microcapsules with an average diameter prepared by an interfacial deposition technique (abstract). Ganguly discloses hollow polystyrene microspheres prepared by interfacial deposition techniques. The effect of polymer concentration on microsphere size and wall thickness was studied (abstract). Tickner discloses microbubbles having diameters in the 0.5 to 300 micron range (abstract). Such microbubbles have a gelatin membrane which encapsulates a gas, and are useful in ultrasonic imaging (pages 6 – 7).

The cited art is directed towards microballoons similar to those claimed in their structure, size range and polymers used. The present claimed invention discloses various polymers that can be used in the shell of the microballoon. Interfacial polymer deposition to produce the membrane/shell of microballoons is well known in the art. Also, hollow microballoons similar in design to those claimed have been widely used as contrast enhancing agents in echography. It would have been obvious to one of ordinary skill in the art at the time of the instant invention to obtain the claimed microballoons in view of the cited art because i) the art discloses microballoons that are hollow, biodegradable, similar in size and for the same use as those claimed; ii) the hollow microballoons are formed via interfacial polymer deposition as claimed (Ganguly; Makino); and iii) the identical/similar polymers as claimed are employed by the cited art, e.g. polylactide (Makino); gelatin as the polypeptide/protein (Tickner). One would have been motivated to combine the cited art in order to optimize the preparation of microballons for in vivo use. Regarding the functional description of the microbubbles as "resilient" or "deformable," such relative terms do not have clear art-recognized

values wherein if a microbubble has a particular value for resilience or deformation, for instance, the microbubble would clearly, or not be, resilient or deformable.

Conclusion

No claims are allowed at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leah Schlientz whose telephone number is 571-272-9928. The examiner can normally be reached on Monday - Friday 8 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Hartley can be reached on 571-272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LHS

MICHAEL G. HARTLEY
SUPERVISORY PATENT EXAMINER